

WHAT IS CLAIMED IS:

1           1. An optical subscriber system comprising: station  
2 equipment: a plurality of subscriber units; a transmission line  
3 for transmitting trailing signals from the station equipment to  
4 the plurality of subscriber units and transmitting leading  
5 signals from the plurality of subscriber units to the station  
6 equipment; and a star coupler for branching trailing signals  
7 and combining the leading signals,

8           the station equipment comprising a transmission line  
9 distance monitor/processor unit which sends a distance  
10 measuring control signal to each of the subscriber units,  
11 measures, based on a distance measuring signal returned from  
12 each of the subscriber units, the transmission line distance  
13 between the station equipment and each of the subscriber units,  
14 and judges whether the transmission line distance is larger or  
15 smaller than a reference value.

1           2. The optical subscriber system according to claim 1,  
2 wherein the station equipment further comprises a trailing  
3 signal multiplexer and a leading signal separator and functions  
4 to multiplex the distance measuring control signal, generated  
5 in the transmission line distance monitor/processor unit, in  
6 the trailing signal multiplexer to prepare a trailing signal,  
7 which is then sent to each of the subscriber units, and to  
8 separate, from a leading signal returned from each of the  
9 subscriber units, a distance measuring signal, in the leading  
10 signal separator, which is then sent to the transmission line

11 distance monitor/processor unit.

1 3. The optical subscriber system according to claim 2.  
2 wherein

3 the transmission line distance monitor/processor unit  
4 comprises a distance measuring control signal generator, a  
5 distance measuring section, and a distance judgment section.  
6 and

7 the distance measuring control signal generated in the  
8 distance measuring control signal generator is multiplexed in  
9 the trailing signal multiplexer to prepare a trailing signal,  
10 which is then sent to each of the subscriber units, and a  
11 distance measuring signal is separated from a leading signal,  
12 returned from each of the subscriber units, in the leading  
13 signal separator to prepare a distance measuring signal that is  
14 then input into the distance measuring section which sends a  
15 distance signal to the distance judgment section for judging  
16 whether the transmission line distance is larger or smaller  
17 than a reference value.

1 4. The optical subscriber system according to any one of  
2 claims 1 to 3, which, when the transmission line distance is  
3 larger than the reference value, issues an alarm.

1 5. A method for monitoring the transmission line distance  
2 between station equipment and each of a plurality of subscriber  
3 units in an optical subscriber system comprising: station  
4 equipment; a plurality of subscriber units; a transmission line

5 for transmitting trailing signals from the station equipment to  
6 the plurality of subscriber units and transmitting leading  
7 signals from the plurality of subscriber units to the station  
8 equipment; and a star coupler for branching trailing signals  
9 and combining the leading signals, said method comprising the  
10 steps of:

11 sending a distance measuring control signal from the  
12 station equipment to each of the subscriber units;

13 measuring the transmission line distance based on a  
14 distance measuring signal returned from each of the subscriber  
15 units; and

16 judging whether the transmission line distance is larger  
17 or smaller than a reference value.

1 6. The method according to claim 5, wherein

2 the station equipment comprises: a transmission line  
3 distance monitor/processor unit comprising a distance measuring  
4 control signal generator, a distance measuring section, and a  
5 distance judgment section; a trailing signal multiplexer; and a  
6 leading signal separator, and

7 a distance measuring control signal generated in the  
8 distance measuring control signal generator is multiplexed in  
9 the trailing signal multiplexer to prepare a trailing signal  
10 which is then sent to each of the subscriber units.

1 7. The method according to claim 6, wherein

2 a distance measuring signal is separated from a leading  
3 signal, returned from each of the subscriber units, in the

4 leading signal separator to prepare a distance measuring signal  
5 that is then input into the distance measuring section which  
6 sends a distance signal to the distance judgment section for  
7 judging whether the transmission line distance is larger or  
8 smaller than a reference value.

1 8. The method according to any one of claims 5 to 7.  
2 wherein, when the transmission line distance is larger than the  
3 reference value, an alarm is issued.

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